**(10/22/2014)STATEMENT OF WORK FOR**

***A History of NASA's Near-Earth Object Program***

## 1.0 Summary:

This statement of work describes the requirements for completing a scholarly, analytical book-length manuscript that will serve as a history of NASA's Near-Earth Object (NEO) Program. The work shall conform to similar works in the NASA History Series, such as *Science in Flux: NASA's Nuclear Program at Plum Brook Station, 1955-2005* by Mark D. Bowles and *Stages to Saturn: A Technological History of the Apollo/Saturn Launch Vehicles* by Roger E. Bilstein.

The goal of this project is to produce a publication of approximately 100,000 words (~400 manuscript pages) for NASA employees, policy analysts, public officials, scientists and engineers, historians, and an informed lay audience. The intent of this project is to have a contractor research and write a manuscript that will serve as the basis for both a print book and various electronic versions. The NASA History Program Office will manage professional review and oversight of final publication of the manuscript as a NASA Special Publication (SP).

## 2.0 Contractor Responsibilities:

The contractor will follow the procedures and guidance provided in the NASA History Program Production Kit and Style Guide at http://history.nasa.gov/productionkit/productionkit.doc and http://history.nasa.gov/styleguide.html online.

Images for the manuscript shall be delivered in full-size high-resolution (300 dpi scan at a minimum of 5" wide or comparable resolution at original size) graphics files in JPEG or PNG file formats. These images are to be delivered as separate files, not integrated into the electronic manuscript files. Directions on how to indicate the placement of images in the manuscript are included in the Production Kit. The contractor shall be responsible for collecting appropriate images and obtaining the relevant permission to use them. Permissions are to be documented on release forms from the appropriate person or organization and will be submitted along with the graphics files. All NASA images will be identified by NASA image number. Print versions of the work will only contain a limited number of black and white images. Electronic versions can be illustrated more completely in full color. Therefore, the contractor will provide color images when available, and is encouraged to provide supplemental images and audio/video files that might be used in electronic versions of the work.

The finished manuscript must reflect extensive prior research of NASA records, other relevant Federal executive branch records, Congressional testimony, scientific journals, reputable news sources, personal paper collections, and, as appropriate, public and private archives. Should any previously unknown archival material be located during the course of completing this work, it should be cited and thus made known to future researchers. Citation guidance and examples can

be found in the Style Guide. Original research materials that are not readily available from other libraries and archives, including any oral history interview recordings and transcripts (and their requisite release forms), collected during the project shall be archived with the NASA History Program Office, forming a coherent collection other researchers can use for future histories.

The contractor shall submit written progress reports of at least 300 words by electronic mail to the contract project manager each quarter. The contractor will submit invoices to the NASA Shared Services Center as directed. The contractor shall provide all other deliverables to the contract project monitor on the milestone dates shown in section 5.0 below. If the contractor completes his or her work ahead of the milestone dates, NASA encourages the contractor to submit this work early for early review and potential early payment.

The contractor shall turn in a draft version of the manuscript that is intellectually rigorous and reflects a clear and concise synthesis of the major themes relating to the history of the NASA NEO Program. The manuscript deliverable will come in the form of electronic files prepared according to the directions contained in the Production Kit, which includes mandatory instructions regarding the formatting of text in Microsoft Word files ("tagging") using the style palette (not the formatting toolbar).

The contractor will respond to comments and questions generated during the NASA History Program Office's evaluation of the manuscript and the subsequent peer review process. The contractor will revise the draft in response to recommendations and questions. The contractor will also participate in reviews of the manuscript as it passes through the copyediting and layout stages of production. This commitment includes reading the copyedited version of the manuscript and the page proofs word for word to ensure accuracy.

The contractor shall carry out the project using contractor office space, equipment, and supplies. The research for this project entails unclassified materials so no security clearance is required.

**3.0: NASA Responsibilities**

The NASA History Program Office shall manage professional review and oversight of publication of the manuscript in a variety of possible formats. The NASA History Program Office shall attempt to publish the book within one year of the submission of the completed final peer-reviewed manuscript. The individual(s) involved in the writing of the work shall be listed as author(s) of the published work. NASA retains the final right to publish or not to publish the contracted manuscript.

The NASA History Program Office shall assign a project manager as the primary point of contact for the contractor. Other History Program Office staff may provide feedback, assistance and guidance in coordination with the project manager.

The NASA History Program Office will provide a current style guide and electronic templates at the start of the project and will inform the contractor if there are any updates or changes to those documents during the course of the contract.

While the primary work will be done using contractor office space, equipment and supplies, the contractor will be provided with access, as available, to workspace and photocopying equipment when conducting research in the NASA Headquarters Historical Reference Collection.

The NASA History Program Office shall provide feedback by electronic mail to contractor quarterly reports within two business weeks.

The NASA History Program Office shall evaluate the draft manuscript for format, editorial and substantive aspects, and intellectual quality within 30 days of submission. Feedback will be provided on the electronic files that will be returned to the contractor for correction/revision as necessary.

Once the NASA History Program Office determines that the draft manuscript is ready for peer review, it will coordinate and manage a peer review by a panel selected by the History Program Office. Identities of the peer reviewers will not be provided to the contractor. Peer review comments will be provided to the contractor within two months.

The NASA History Program Office will work with support organizations to copyedit the post-peer review manuscript and provide electronic versions of the files to the contractor for review. Similarly, the NASA History Program Office will work with support organizations to layout the manuscript and will provide the contractor with page proofs for review.

While inputs from the contractor regarding the index are welcome, the NASA History Program Office will be responsible for ensuring that the index is completed.

The NASA Historical Reference Collection shall serve as the repository for copies of research notes developed, photocopies of documents uncovered, correspondence collected, any oral history interview recordings and transcripts, and images collected in the course of the project.

NASA shall pay the contractor upon successful completion of each milestone event and upon submission of the appropriate invoice as specified in section 5.0 below.

**4.0 Scope**

This book will document the history of Near-Earth object observation and characterization from its beginnings through 2014, focusing primarily on NASA's Near-Earth Object Program. It will cover:

-NEO science and technology
-the NEO Program budget
-politics and policy relating to the NEO Program

- the roles of NASA Headquarters, the Jet Propulsion Laboratory, and other NASA Field Centers in the program

-NASA NEO Program interactions with other federal agencies, including the Departments of Defense, Energy, Homeland Security (specifically, the Federal Emergency Management Agency), and State

-interactions with other national, international, and multinational organizations, including the United Nations Committee on the Peaceful Uses of Outer Space and the International Astronomical Union's Minor Planets Center

-key individuals in the history of the Program

-key events relating the program, including events of 2010-2013 leading to the White House proposal for an asteroid redirect mission.

This manuscript should provide some "prehistory" (before 1958) and scientific background information as an introduction to, and foundation for, the history of the NEO program. Topics to be covered could include, for example, the discovery of near-Earth objects (asteroids and comets), early ground-based observations in the U.S. and elsewhere; and formulation and validation of the impact theory of crater formation. The history should address key milestones in the history of the NEO program such as:

-the Tunguska impact event of 1908 and 100+ years of study

-the 1978 discovery of the Chicxulub impact crater and validation of the theory that it was created by a NEO impact

-in response to Congressional direction in the 1990s, NASA initiated a series of NEO studies

-NASA's formal establishment of a NEO Program in May 1998

-the U.S. Air Force Space Command's unsuccessful attempt to add planetary defense to its mission during the late 1990s

-the discovery of 2008 TC3 on 6 October 2008, and impact over Sudan on 7 October 2008

-the discovery/flyby of 2012 DA14 and the Chelyabinsk impact event of 15 February 2013

-the White House's April 2013 unveiling of plans for a NASA "asteroid initiative," encompassing an expanded NEO observation and characterization program, a robotic "asteroid redirect mission" (ARM) and a human mission to that captured asteroid

Thus the main chronological timeframe to be covered by this book manuscript should extend from 1958 – 2014.

**Relevant Literature**

This history project should build upon the existing literature on this subject such as:

Air University Spacecast 2020 Study Group, "Preparing for Planetary Defense: Detection and Interception of Asteroids on Collision Course with Earth" (white paper, 1994)

Asimov, Isaac, with revisions and updating by Richard Hantula, *Asteroids* (Gareth Stevens Publishing, 2002)

Binzel, Richard P.; Gehrels, Tom; and Matthews, Mildred Shapley, editors; *Asteroids II* (University of Arizona Press, 1989)

Bottke, William F. Jr., *et. al*., editors, *Asteroids III* (University of Arizona Press, 2002)

Elkins-Tanton, Linda T. *Asteroids, Meteorites, and Comets* (Chelsea House, 2006)

Ferris, Timothy, "Is this the End?," *The New Yorker* (January 27, 1997)

Gehrels, Tom, editor, *Hazards Due to Comets and Asteroids* (University of Arizona Press, 1994)

Morrison, David (chair), *The Spaceguard Survey: Report of the NASA International Near-Earth Object Detection Workshop*, NASA Technical Monograph TM-107979 (1992).

Yeomans, Donald K., *Near-Earth Objects: Finding Them Before They Find Us* (Princeton University Press, 2013)

A number of other useful bibliographic sources are listed at
http://www.hq.nasa.gov/office/hqlibrary/pathfinders/aster.htm

Also see:
http://www.minorplanetcenter.net/iau/NEO/TheNEOPage.html

http://www.oosa.unvienna.org/oosa/en/COPUOS/stsc/wgneo/index.html

http://www.nss.org/resources/library/planetarydefense/index.htm

**5.0: Deliverables and Payment**

Below are the deadlines for each milestone. NASA would like to encourage the contractor to submit work early whenever possible.

**Milestones**

| Time After Award of Contract | Conditions to be Met |
|---|---|
| ***Base Contract Year*** | |
| 3 Months | Progress report |
| 6 Months | Progress report, outline of historical project, research plans, and preliminary bibliography |
| 9 Months | Progress report, copies of oral history transcripts |
| 12 Months | Progress report, copies of oral history transcripts |
| ***Option Year 1*** | |
| 15 Months | Progress report, interview transcripts, archival status, draft chapters of first third of manuscript |
| 18 Months | Progress report, interview transcripts, draft chapters of middle third of manuscript |
| 21 Months | Progress report, draft chapters of final third of manuscript, graphics plan |
| 24 Months | Progress report, archival status |
| ***Option Year 2*** | |
| 27 Months | Progress report, revised chapters of first half of manuscript |
| 30 Months | Progress report, revised chapters of remainder of manuscript |
| 33 Months | Progress report, final manuscript acceptable for peer review |
| 36 Months | Progress report, revised manuscript in response to peer review comments and detailed summary of revisions |